

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An anaerobic treatment process for the conversion of organic material to soluble and gaseous components comprising the steps:

contacting an influent stream containing the organic material with anaerobic bacteria from an anaerobic reactor;

maintaining the organic material in contact with the anaerobic bacteria for a predetermined period to partially digest the organic material;

mechanically or chemically separating suspended colloidal constituents and particulate constituents from the partially digested influent stream; and

delivering the separated suspended colloidal constituents and particulate constituents to the anaerobic reactor for further digestion of organic material.

2. The process of Claim 1, wherein the organic material of the influent stream comprises soluble, colloidal, and particulate constituents, the maintaining step reducing the level of soluble constituents, and other constituents that cannot be removed in the separating step to a level that meets process effluent requirements.

3. The process of Claim 1, wherein the predetermined period is less than about 12 hours.

4. The process of Claim 1, wherein the mechanical or chemical separation is selected from the group of separation techniques consisting of chemically induced sedimentation, flotation, and centrifugation.

5. The process of Claim 4, wherein the flotation separation technique comprises gas flotation.

6. The process of Claim 1, wherein the influent stream comprises soluble, colloidal, and particulate constituents having differing hydrolysis rates, a portion of the colloidal and particulate constituents being substantially hydrolyzed after the predetermined period.

7. The process of Claim 6, wherein the soluble constituents are substantially metabolized in the predetermined period.

8. The process of Claim 1, wherein the solids content of the separated stream of suspended colloidal constituents and particulate constituents is about 4 to 12 weight percent.

9. The process of Claim 1, wherein the predetermined period is less than about 8 hours.

10. The process of Claim 1, wherein substantially all of the suspended colloidal constituents and particulate constituents components are separated from the partially digested influent stream without adversely affecting the anaerobic bacteria.

11. The process of Claim 1, further comprising a step of elutriating soluble products of digestion from the anaerobic bacteria by contacting the bacteria with dilution water or a dilute influent stream.

12. The process of Claim 1, wherein the mixture of influent stream and with anaerobic bacteria is maintained at a first temperature and the anaerobic reactor is maintained at a second temperature different from the first temperature.

13. The process of Claim 1, wherein the contact between the influent stream and the anaerobic bacteria is carried out in a fixed film reactor.

14. The process of Claim 1, wherein the contacting of the influent stream with the anaerobic bacteria is carried out using a carrier-assisted process.